Department of Toxic Substances Control

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**To:** Kurt Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board – Region 8
3737 Main Street, Suite 500 – First Floor
Riverside, CA 92501

**Date:** April 14, 2011

**Subject:** Storm Water Infiltration Proposal Meeting Notes and Recommendations

Kurt,

Attached are my notes from the meeting I attended at the Santa Ana Regional Water Quality Control Board offices on March 28, 2011. The meeting was arranged to discuss Municipal Separate Storm Sewer System (MS4) conveyance system permit requirements and potential impacts to DTSC Brownfield projects. A list of attendees and a general summary of my observations are included in the attached notes.

Basically, the discharge of pollutants into MS4s may cause, contribute to or threaten to cause or contribute to a condition of pollution in receiving waters Federal regulations, 40 CFR 122.26(d)(2)(i), require the MS4 permittees control the discharge of pollutants into MS4s to the extent possible. This permit application requires the on-site storage and infiltration of stormwater.

In this case, the permit is for the County of Orange and the potential impact is limited to that county, but the process will undoubtedly be emulated. My team (**P2*dw* *ACT***) evaluated the proposed permit, conceptual Water Quality Management Plan (WQMP)

and Technical Guidance Document (TGD) for potential statewide Brownfields impact and provided a summary of observations and recommendations (in the notes) that we hope you will consider when reviewing this and other similar permit applications.

If we can provide additional information or assistance, please contact me directly at (714) 484-5462 or via email at swarren@dtsc.ca.gov.

Sincerely,

Scott Warren, C.E.G., C.Hg.
Senior Engineering Geologist
DTSC Agency Collaboration Team (P2*dw ACT*)

Cc via email:

- Richard Boon, Chief, Orange County Stormwater Program
- Greg Woodside, Executive Director of Planning and Natural Resources, Orange County Water District (OCWD)
- Marsha Westropp, Sr. Watershed Planner, OCWD
- Roy Herndon, Chief Hydrogeologist, OCWD
- Mark Smythe, Senior Environmental Scientist, Santa Ana SARWQCB
- Mike Adakapara, Supervising WRCE, SARWQCB
- Adam Fischer, Staff Environmental Scientist, SARWQCB

## Storm Water Infiltration Proposal Meeting Notes
### *An Issue with Potential Systemic Impacts*

On March 28, 2011, I participated in a Storm Water Infiltration Discussion with representatives of the:

- Orange County Stormwater Program,
- Orange County Water District
- Water Quality Control Board, Santa Ana Region

The Santa Ana Regional Water Quality Control Board (SARWQCB) issued a permit (Order No. R8-2009-0030) to the County of Orange. The County of Orange is the principle permittee, and cities within the Orange County are co-permittees. Orange County Watersheds (OCW) will manage implementation of the permit.

The permit requires that any new development creating 10,000 square feet or more of impervious surface or significant re-development (creating 5,000 square feet or more of impervious surface) must prepare a conceptual and/or project Water Quality Management Plan (WQMP). The WQMP must demonstrate that the project will infiltrate, harvest and re-use, evapotranspire, or biotreat the 85$^{th}$ percentile storm event. Orange County submitted a draft Technical Guidance Document (TGD) to guide the preparation of site specific infiltration feasibility studies to the SARWQCB. Acceptance of the draft TGD is anticipated on April 22, 2011.

Brownfield developments are listed as one of the constraining factors where alternatives to on-site infiltration should be considered. The draft TGD which is used to guide the preparation of the WQMP states that "a site-specific investigation shall always be performed to assess the feasibility of stormwater infiltration when the project proposes to redevelop a previously-contaminated site" [(e.g., Brownfields or otherwise contaminated) Appendix VIII .3.].

In order to infiltrate the storm water on-site, the TGD recommends that developers demonstrate they are not:

1. Infiltrating through contaminated soil,
2. Infiltrating into an existing groundwater plume so as to detrimentally impact water quality or exacerbate plume migration,
3. Infiltrating water into an area where groundwater is shallow and/or may discharge into sewer lines,
4. Infiltrating in areas of shallow groundwater subject to liquefaction, or
5. Infiltrating into areas where infiltration could be expected to exacerbate landslide potential.

The burden of proof will fall on the applicant/developer to determine if these conditions exist. Orange County Water District prepared a map showing broad areas of suspected plumes. In addition to the plume, the county's consultant identified areas with shallow water where infiltration could impact existing infrastructure or exacerbate geotechnical conditions. The map shows these areas as "constraint areas".

In "plume" areas, developers will be required to search existing databases for nearby sites, test soil on their site and test groundwater quality beneath their site before receiving approval to infiltrate. Outside of the predetermined "constraint" areas, developers will have to check existing databases for plumes and complete the steps outlined in the TGD. Redevelopment projects beyond the predetermined "constraint" areas may not be required to test the soil or groundwater beneath their site.

Unresolved problems include:

1. Detrimental impact to groundwater remains undefined in terms of how much of a chemical change is an impact, or what volume of water could present a problem.
2. The definition of "impacted" is undefined. For example the authors of the guidance indicated a desire to avoid using a numerical value such as MCL to indicate "impacted". The lack of a clear boundary condition means each city could establish its own boundary condition.
3. Infiltration at one site could exacerbate plume migration or detrimentally impact an ongoing remediation effort at another site (by seasonally changing plume migration or increasing the volume of water in an aquifer for example).
4. Orange County is made up of 26 cities that will approve the permit applications. How consistency will be maintained is unspecified.
5. Infiltration calculations are based on a two year rain event. The TGD does not consider 25 year, 50 year or 100 year rain events and the resulting increased infiltration.
6. The author does not discuss any monitoring to verify the basic calculation and assumed area of influence. The TGD should consider the potential impact of larger rain events on plumes, based on the site specific aquifer characteristics.
7. Redevelopment projects often include multiple sites that are clustered in a general area. The TGD does not discuss the cumulative impact of site clustering and the resultant cumulative impact of larger volumes of infiltration in a small geographic area. The TGD should address that concern and the monitoring needed to assess cumulative impact, on groundwater plumes.
8. The TGD should provide a unique and standardized project tracking number for all submittals.
9. The TGD should define "non-compliance" of an already approved infiltration system. The TGD should propose mechanisms to track and if necessary ameliorate impacts if detected.

It is anticipated that this requirement will affect approximately 100 redevelopment applications per year in Orange County. This approach is being driven nationally by the U.S. EPA and the meeting attendees indicated that they believe Ventura, San Bernardino, Riverside and Los Angeles counties are pursuing similar stormwater management strategies. 1,000 or more annual redevelopment applications statewide is possible in the near future.

The representatives at the meeting expect the SARWQCB to solicit public comment on the permit implementation plans prepared by the County of Orange (Model WQMP and TGD) and to consider directing the SARWQCB's Executive Officer to approve or disapprove the documents.

Tracking cases where infiltration is not allowed due to contamination and tracking infiltration around existing remediation systems is in the public's interest. I recommend DTSC or SARWQCB be notified when on-site infiltration is not allowed due to existing soil or groundwater contamination. Additionally, I recommend DTSC or SARWQCB be notified of large infiltration projects and/or when clusters of infiltration projects are proposed that could impact ongoing remediation systems.

I propose the cities complete the attached form when data indicates a plume (in soil or groundwater) exists, and when large quantities of water that could impact existing remediation systems will be infiltrated. DTSC or SARWQCB can then document plumes that may otherwise go undetected and/or be advised of potential seasonal shifts that could impact remediation system design and performance. I propose the forms be electronically submitted to an enterprise data management system (such as GeoTracker or EnviroStor) supported by the SARWQCB or DTSC along with an email, notifying the DTSC Duty Officer or SARWQCB Supervising Water Resources Control Engineer of the findings

## Suggested Electronic Reporting Form

| | | | |
|---|---|---|---|
| ***Name*** | | | |
| Facility Name | | Contact Name | |
| Statewide Project Tracking Number | | Company Name | |
| Street Address | | Street Address | |
| City/State/Zip | | City/State/Zip | |
| Capture Area (Sq. Ft) | | Contact Phone No. | |
| Est. Volume of Infiltration/Yr. | | Contact email | |
| Est. 10 Yr Event Infiltration Volume | | Est. 25 Yr Event Infiltration Volume | |
| Est. 50 Yr Event Infiltration Volume | | Est. 100 Yr Event Infiltration Volume | |
| ***Location*** | | | |
| Surface Elevation | | | |
| Lat. & Long. of "Site" Corners | | Lat. & Long. of Infiltration Portal(s) | |
| A. | | | |
| B. | | | |
| C | | | |
| D. | | | |
| Infiltration Type: (Gravity/Pumped) | | Depth to Infiltration Point: | |
| Average Infiltration Rate: | | Maximum Infiltration Rate: | |
| Infiltration Screen Height & Diameter: | | TD: | |
| Surface Seal Thickness: | | Sand Pack/Infiltration Material/Design: | |
| ***Contaminant Detected*** | ***Sampling/Analytical Method (attach results)*** | ***Media (Soil Matrix/Soil Gas; depth)*** | ***Concentration (Specify Units)*** |
| Cont 1 | | | |
| Cont 2 | | | |
| Cont 3 | | | |

| ***Groundwater:*** | ***Chemical*** | ***Concentration*** | ***Depth*** | ***Elevation*** |
|---|---|---|---|---|
| Well 1 | | | | |
| Well 2 | | | | |
| Well3 | | | | |
| Other: | | | | |

Submit Electronically to: DTSC Portal

The current proposal calls for using *"State Certified Professionals"*. I recommend the language be changed to state licensed Professional Civil Engineer (PE) and/or Professional Geologist (PG) as appropriate.

A copy of the *"Summary of Information and Analysis Needed for Properties with Proposed Stormwater Infiltration Having Soil or Groundwater Contamination (Draft)"* document, copies of the North Orange County flowchart and South Orange County flowchart, and a copy of the "*Preliminary Map – Subject to Further Revision*" documents prepared by Orange County are attached.

## Meeting Attendees:

- Richard Boon, Chief, Orange County Stormwater Program (714) 955-0670

- Greg Woodside, Executive Director of Planning and Natural Resources, Orange County Water District. (714) 378-3275
- Marsha Westropp, Sr. Watershed Planner, OCWD (714) 378-8248
- Roy Herndon, Chief Hydrogeologist, OCWD (714) 378-3260

- Mark Smythe, Sr. Env. Sci, Santa Ana SARWQCB (951) 321-4580
- Mike Adakapara, Sup. WRCE, SARWQCB (915) 782-3238
- Adam Fischer, Staff Env. Sci., SARWQCB (951) 320-6363

- Scott Warren, Sr Eng Geologist, DTSC **P2*dw* *ACT*** (714) 484-5462

# Attachments

**Summary of Information and Analysis Needed for Properties with Proposed Stormwater Infiltration Having Soil or Groundwater Contamination (Draft)**

1. Lateral and vertical extent of soil or groundwater contamination is defined at the site and off-site if contamination has migrated to the boundary of the site;

2. Groundwater conditions are defined with site specific data (subsurface sediment characteristics, depth to groundwater, groundwater flow direction, rate of groundwater movement);

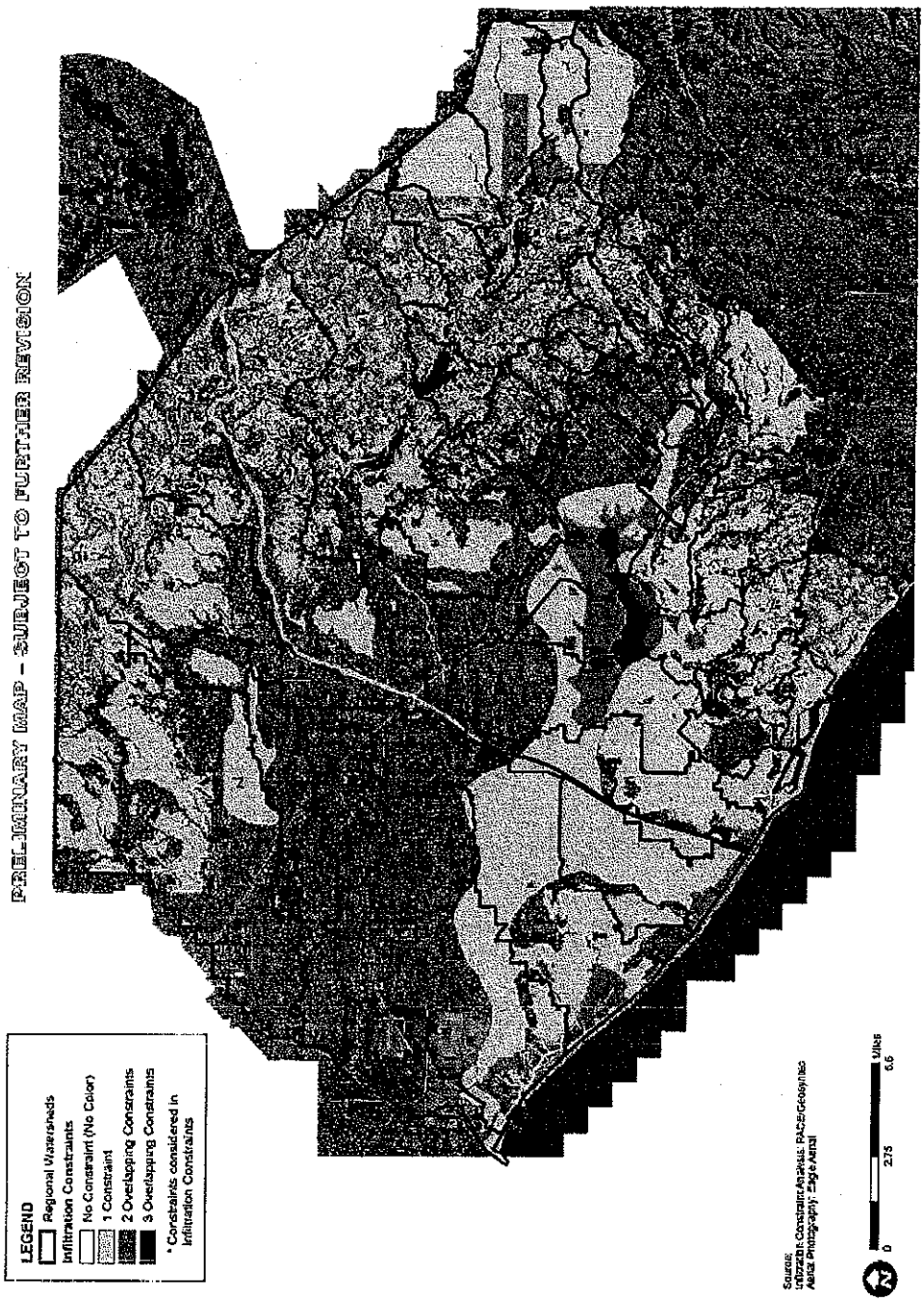
3. On-going monitoring of soil or groundwater contamination is occurring and will continue to occur;

4. State-certified professional evaluates soil and groundwater data and evaluates whether proposed stormwater infiltration could cause adverse impacts to groundwater quality; an adverse impact to groundwater quality could include changing the movement of groundwater contamination, causing additional amounts of contamination in the unsaturated zone to migrate into the saturated zone, or negatively impacting an existing remediation system;

5. Regulatory agency has continuing authority to require additional investigation or cleanup work if stormwater infiltration causes an adverse impact on groundwater quality;

6. Written report is prepared documenting items 1 through 5; report should be prepared by a state-certified professional and provided to OCWD for review and comment;

7. Infiltration should not be allowed for sites that pose an adverse risk to groundwater quality.


PRELIMINARY MAP - SUBJECT TO FURTHER REVISION
LEGEND
Regional Watersheds
Infiltration Constraints
No Constraint (No Color)
1 Constraint
2 Overlapping Constraints
3 Overlapping Constraints
* Constraints considered in Infiltration Constraints
Source:
Infiltration Constraint Analysis: RACE/Geosyntec
Aerial Photography: Eagle Aerial
0
2.75
5.5
Miles

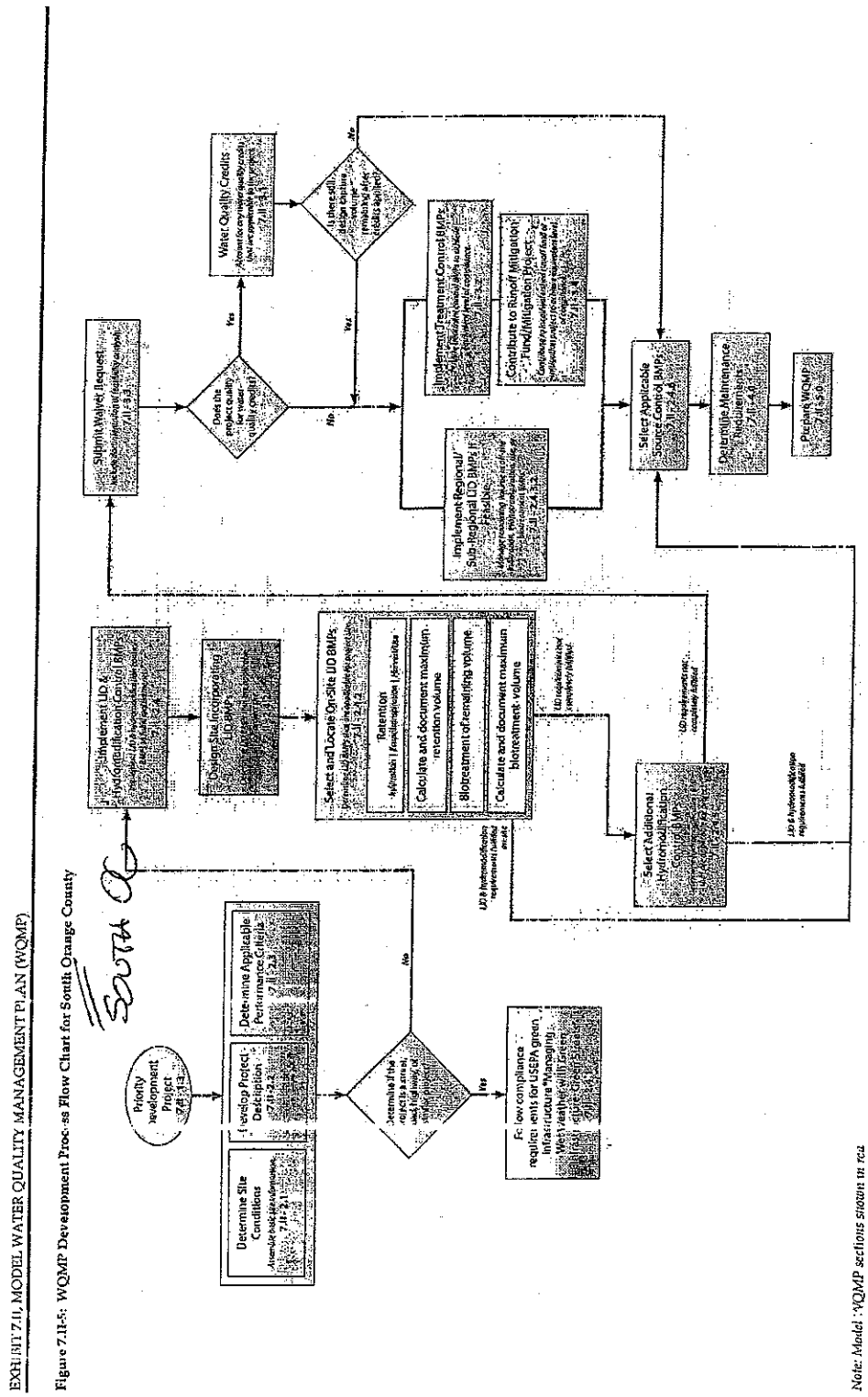


EXHIBIT 7.II, MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)
Figure 7.II-5: WQMP Development Process Flow Chart for South Orange County
South
Priority Development Project
Determine Site Conditions
Develop Project Description
Determine Applicable Performance Criteria
Water Quality Credits
Submit Waiver Request
Implement Regional/ Sub-Regional LID BMPs
Implement Treatment Control BMPs
Contribute to Runoff Mitigation Project
Select Applicable Source Control BMPs
Determine Maintenance Responsibility
Prepare WQMP
Design Site Incorporating LID BMPs
Select and Locate On-Site LID BMPs
Retention
Calculate and document maximum retention volume
Biotreatment of remaining volume
Calculate and document maximum biotreatment volume
Select Additional Hydromodification Control BMPs
Yes
No
Note: Model WQMP sections shown in red
7.II-1-14
March 22, 2011
FINAL DRAFT

NORTH OC

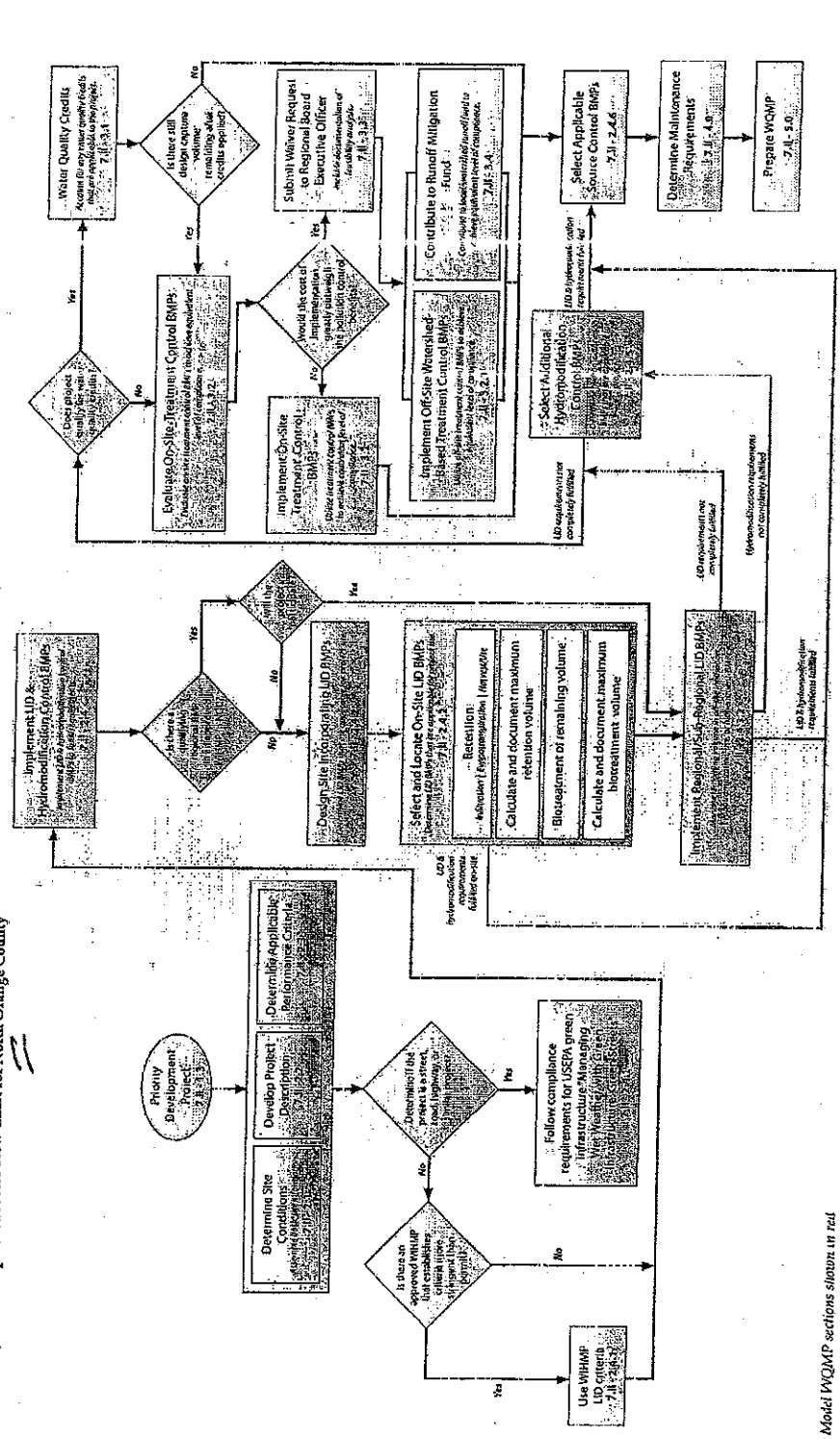



EXHIBIT 7.II, MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)

**Figure 7.II-4: WQMP Development Process Flow Chart for North Orange County**

*Note: Model WQMP sections shown in red*

7.II 1-13

FINAL DRAFT

March 22, 2011